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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/768,168	02/02/2004	Terunao Hanaoka	109690.01	6030
25944	7590	02/08/2005	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			LE, THAO P	
			ART UNIT	PAPER NUMBER
			2818	

DATE MAILED: 02/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/768,168	Applicant(s) HANAOKA ET AL.	
	Examiner Thao P. Le	Art Unit 2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1 page</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. Information Disclosure Statement (IDS) filed on **02/02/04** and made of record.

The references cited on the PTOL 1449 form have been considered.

2. Claims 1-23 are pending in this application.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 1, 7-17, 20-23 are rejected under 35 USC 102 (a) as being anticipated by Nelson, U.S. Patent No. 4984358.

Regarding claims 1, 20-21, Nelson discloses a method of fabricating a semiconductor device comprising (See Figs. 1-14 and Cols. 1-8): forming a through hole 30d in a semiconductor element (Fig. 8A), forming a conductive layer 34d which is electrically connected to the electrodes and is though front surface to back surface of the semiconductor element (Figs. 6B, 7B, 8A-8B), and that the conductive layer is formed to have connecting portions on the front and back surfaces so that a distance between at least two electrodes is different from a distance between the connecting portions on one of the front and back surface (See Figs. 1-14).

Hikita et al., U.S. Patent No. 6404061 and Bertin et al., U.S. Patent No. 6222276 also disclose the limitations as cited in claim 1.

Regarding claims 7-11, Nelson discloses the formation of stress relieve (pad) on the first and second surfaces before forming a conductive layer.

Regarding claims 12-15, Nelson discloses the distance between the connecting portions is wider than between adjacent electrodes, forming an external terminals or solder balls (figs 7B, 8B, cols. 4-5).

Regarding claim 16, Nelson discloses the step of forming protective layer (the dielectric layer) over the area except the connecting portions.

Regarding claim 17, Nelson discloses the formation of insulation layer 32 in the inner wall of the through hole and wherein the conductive layer is formed on the insulation layer (Fig. 8).

Regarding claims 22-23, Nelson discloses the method of claim 1 and connecting two semiconductor devices by the conductive layer and the cutting the semiconductor wafer into separate pieces (abstract, Cols. 1-8, Figs. 9-14).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the

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subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2-6, 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson, U.S. patent No. 4984358.

Regarding claims 2-6, Nelson discloses the formation of a through hole by laser beam, forming a hole communicating with the through hole, connecting portions are disposed in a center portion of the semiconductor element on the inside of the through hole. It would have been obvious to one having ordinary skill in the art to form a small hole with smaller diameter than through hole, and forming the through hole by enlarge the small holes using wet etching in order to control the size of the through hole.

Regarding claims 18-19, Nelson discloses the insulating material is used to fill the through hole but doesn't mention that the insulating material is resin. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use resin as insulating material to fill in the through hole because resin provide good insulator and adhesion in integrated circuits.

7. When responding to the office action, Applicants' are advice to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist the examiner to locate the appropriate paragraphs.

A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao P. Le whose telephone number is 571-272-1785. The examiner can normally be reached on M-T (7-6).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on 571-272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Thao P. Le
Examiner
Art Unit 2818